FCC BAM

USER MANUAL

Developed by CostQuest Associates

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Contents

Introduction and Overview

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This document provides a user of the FCC's Broadband Assessment Model (BAM) an understanding of how to interact with the BAM to generate output to serve the user's interests in support of federal agency and congressional policy considerations relevant to the deployment and adoption of broadband. To ensure a complete understanding of the model goals and underlying assumptions the BAM User Manual should be read in conjunction with the BAM Documentation. The User Manual is not intended to be a technical model administration manual.   As much of BAM processing resides in a Microsoft SQL Server 2008 environment, most technical administration is considered within the realm of Database Administration.

The BAM includes a comprehensive collection of inputs, assumptions and modeling logic about where broadband Internet access currently exists across the country – and more importantly, where broadband access does not exist. Further, the BAM develops an estimate of costs (and revenues) that can be expected if infrastructure in areas currently unserved is augmented to provide broadband coverage based on a variety of assumptions (primarily speed and technology).

The BAM processes model scenarios (defined by a set of user selections) to develop an expected economic contribution margin for augmenting (i.e., bringing service to) unserved areas. Three technology options (across a number of different topologies) are considered within the BAM: wireline (e.g., DSL), wireless (both fixed and mobile) and cable.

The schematic here provides an overview of the BAM flow for gathering inputs, processing solution sets and generating reports.

Setup and System Requirements

The BAM has been developed in two components. A very thin 'client' which runs on a standard Windows PC (tested under Microsoft Windows XP or later supporting the .Net 3.0 framework) and a database server (which runs on Microsoft SQL Server 2008.

The client application is a small executable. It has no installation requirements other than the .net framework. The first time it is run it will prompt the user for the name of the database server to log into. The application is precompiled using named user (SQL Authentication) security. If a user wants to import solution sets (described later in this manual), they will need Microsoft Excel on the computer from which they are running BAM.

Solution Set

A Solution Set is a collection of output data processed by the model based on user defined settings and Input Collections. Specifically, Solution Set output (processed data) is a function of the user specifying (1) the States to be included in the scenario, (2) the toggle settings that best fit user requirements and (3) the underlying Input Collection consistent with user needs.

The selection of States is self explanatory. Users can process a single state, a collection of States or the entire 50 state nation plus Washington DC. [The model is designed to accommodate other US territories if/when required input data becomes available.]

The toggle selections enable the user to make decisions such as broadband speed, if the augmentation is performed by a CLEC or not, the study period (in years), an assumed rate of technology adoption (i.e., the inflection point on the Gompertz curve), the number of competitors assumed to be involved with the augmentation and the technology (more specifically, the topology) to be used in the augmentation. The implication of each of these selections is discussed in the full BAM documentation while the process for the user to make these selections is discussed below. These selections are 'dynamic' in that they may change (more toggles added) as the model advances in the weeks ahead.
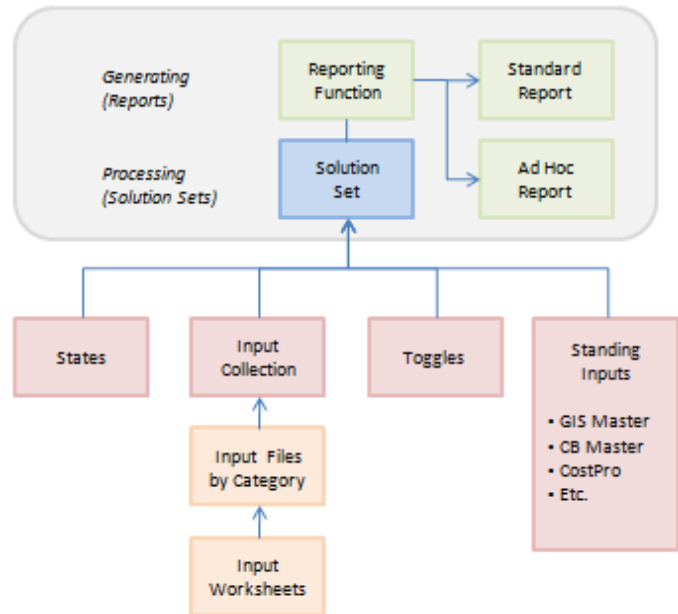
The Input Collection includes the basic data used in the model, underlying assumptions, and pre-processed information to be used in the scenario being developed. The Input Collection establishes things such as the annual charge factor to be used in the model, the specific version of opex inputs to be used, the property tax array to be used in the model, etc.

As noted above, the user selects the States, the designated modeling parameters (i.e., toggles) and the selected Input Collection. In addition, the processing of data into a Solution Set incorporates a predetermined set of standing data from the GIS Master (technology specific geographic attributes known below the Census Block), the CB Master (demographic attributes known at the Census Block and above level), CostProLoop and other pre-processed data. The user does not interact with these standing (core) elements of the BAM.

Reports

There are two different types of BAM reports: standard (pre-defined) reports and ad hoc reports. The ad hoc reporting routine is still under development as of this version of the User Manual and accordingly is not addressed in detail here. However, the objective with the ad hoc reports is to provide an array of high priority 'selections' for a user to report on – and to allow the user to make selections on these reportable elements to fit specific needs.

Standard (pre-defined) reports are also highly customized – but they are pre-defined (i.e., custom built) by the user (or administrator) and maintained within the BAM model structure as a report option. As illustrated in the screen shots below, the user will select a standard pre-defined report from a drop down menu.

Queue

Within the BAM model Solutions Sets are processed and Reports are generated through a queue. This element of the model provides for the staging of a Solution Set to be processed and/or a Report to be generated. Generally, a processed Solution Set is not accessible by users. Processed data (in a Solution Set) is accessed through a report.

Step-by-Step

Specific processing steps and illustrative screen shots are provided below.

The main (first) screen that appears when you open the BAM includes the three primary functions involved in working with the BAM:

- Defining a Solution Set

- Defining a Report

- Queue

## *Selecting or Defining a Solution Set*

As noted above, a Solution Sets has three main components: a defined set of States, a specific set of model parameters controlled by choice of toggle settings and a designated Input Collection. Multiple Solution Sets exist in the model. A user can either select an existing Solution Set for processing or they can create a new Solution Set. See below for information on managing Solution Sets.

When establishing a new Solution Set the first step is to create a unique name for the new Solution Set. This is done in the upper right-hand corner dialogue box in the "Create Solution Set" BAM window. When a new Solution Set is created a Comment section is provided for the user to make notes regarding that Solution Set.

A second step is to select a set of States. This is done in the States area provided. Select **ALL** and select **NONE** options are provide to facilitate the selection process. NONE clears previous selections.

User controlled model parameter elections are made by clicking on a toggle item (e.g., broadband speed, or demand study period or etc.) and then clicking on the desired option in the dialogue box immediately below (or by entering a specific toggle value, as illustrated below).

In the illustration provided here the user has selected the "Telco_Copper_FTTd_12K" option for the Technology toggle. In this example you can also see that previous toggle selections have indicated that the augmentation will not be performed by a CLEC, the study period is 10 years, there will be no ("0") competitors in the augmentation, the Gompertz input table (i.e., assumed rate of broadband adoption) is GT2 and the broadband speed option is set at 768. If the user fails to make a specific election on each and every toggle – a "Please Select Value" dialogue box will appear as a reminder before the Solution Set can be processed (i.e., added to a queue).
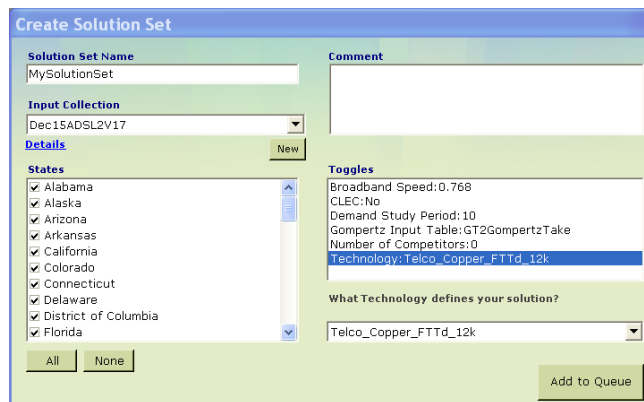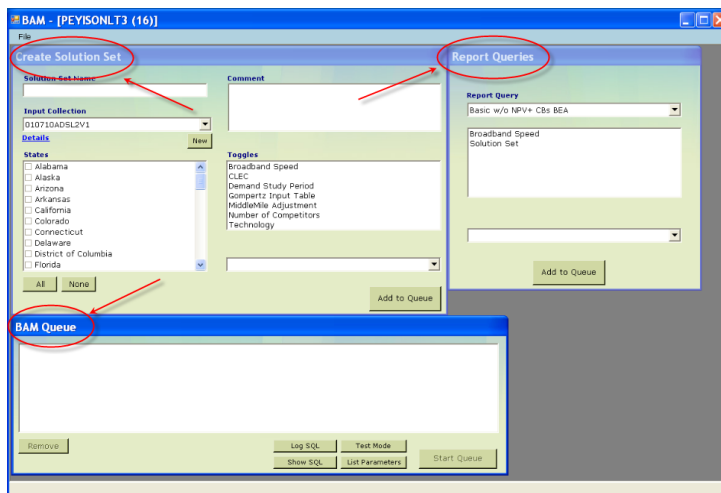
As noted above with certain toggle selections the user is allowed to enter specific values. The screen shot shown here illustrates this functionality for the designation of a FixedWireless Capex Adjustment factor (toggle). The user must click SAVE when entering specific toggle values. This same functionality exists when working with reports as illustrated below.
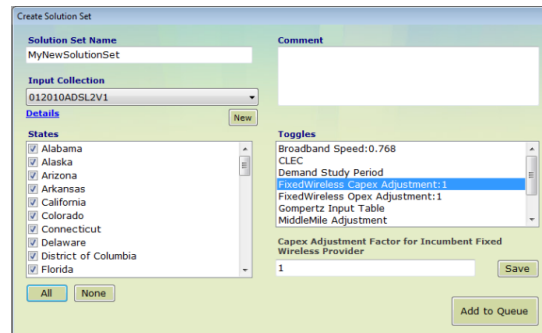
As final step in creating the Solution Set the user will designate an Input Collection. Input Collections are available for user selection immediately below the Solution Set Name box. In the example above (previous page) the Input Collection "Dec15ADSL2V17" has been chosen. See below for information on how to review or create a new Input Collection.

At this point – when the Solution Set has been named, the States have been chosen, the toggles have all been set and the Input Collection has been selected – the Solution Set can be added to the queue for processing. Clicking the **Add to Queue** button inserts the Solution Set name into the Queue area of the main BAM screen. See below for information on processing Solution Sets and generating Reports.

Reviewing and Creating Solution Sets

The BAM will hold multiple Solution Sets. Users can explore / review existing Solution Sets before creating a new one. This is done by way of the File option at the far upper left hand corner of the main BAM screen.
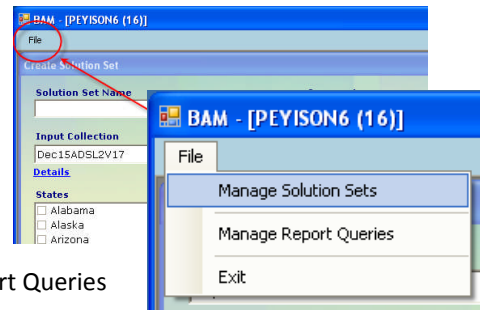
From this point users can elect to manage Solution Sets, manage Report Queries or exit the model.

Clicking on the **Manage Solution Sets** option opens a dialogue as below. From here users can highlight any existing Solution Set and find the date it was created, any comments provided with that Solution Set and most importantly, users can see the underlying 'detail' for the Solution Set – including the Input Collection and the toggle selections used.

[Note: in a future release the States included in a Solution Set will be displayed in this dialogue box.]

Outdated Solution Sets can also be deactivated (and reactivated) from this screen. Deactivated Solution Sets are no longer available for processing.
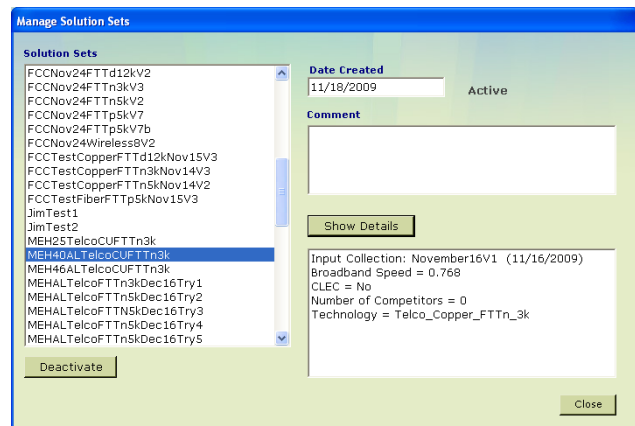
Reviewing and Creating Input Collections

As with Solution Sets, the BAM holds (makes available) a number of Input Collections. As discussed above, an Input Collection is just that – a collection of available input data sets that supply the necessary data (some raw and some preprocessed) and assumption inputs required for processing. Generally Input Collections vary by the 'version' of inputs. Users will typically version their inputs to study different scenarios. An example could be two Input Collections are developed which vary only in the price of certain materials. This allows comparison of output (Solution Sets) given only a change in these known inputs.

Input Collections can be either (a) reviewed and selected from a list of available Input Collections or (b) created new. To review a selected Input Collection click on the **Details** button. To create a new Input Collection click on New.
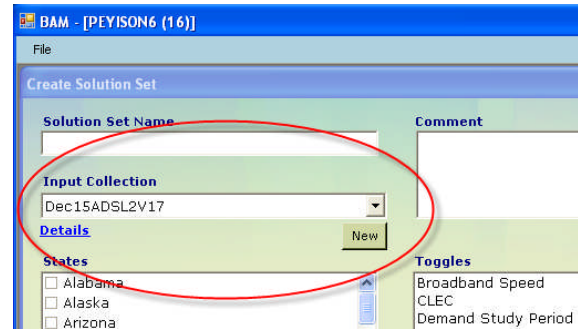
If Detail is selected (clicked) a popup panel with relevant detail appears of the form.

If New is selected the dialogue shown here will be opened. From here one can create a new Input Collection by (1) naming the new Input Collection and (2) selecting available Input Table Names for each of the Input Files – that is, for each element of the Input Collection. The process here is identical to the process used for assigning toggle values for a Solutions Set. That process is to highlight an Input File name and then select the appropriate Input Table Name in the box below. In the illustration above the user is in the process of selecting the Capex_V20_VDSL_MDK file to be used as the Capex input file. An Input Table Name selection must be made for each Input File included in the Input Collection. If this is not done a reminder is provided to the user. In addition, a default name is provided based on the filename selected.

When the Input Collection is completed – that is, when all Input Files–Input Tables have been related – click on **Create** to establish the new Input Collection within the BAM structure.

If in creating the Input Collection none of the available/existing Input Tables meet user needs a new Input File can be imported thru this same dialogue box. This applies if there has been a new data version developed that has not yet been incorporated into the BAM. Select **Import New Input Files** to create new Input Tables. With this selection the dialogue box here will be opened. When the appropriate Input Table is selected, click on **Import** to upload the data and in so doing, create the new Input Table. Be aware that the Import function is dependent upon Microsoft Excel.
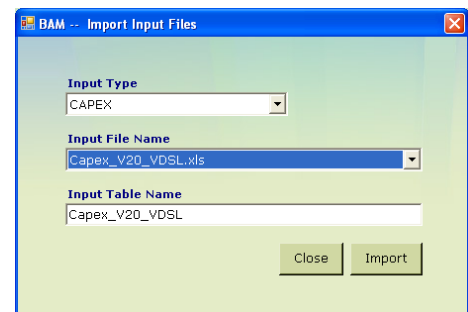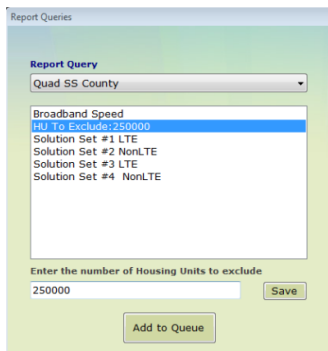
Reviewing or Creating Reports

BAM reports are generated through the Report Queries routine. The dialogue box for this process is located in the upper right hand corner of the main BAM screen (see previous illustration). Reports to be generated can be either selected from an array of existing available reports – or they can be created new.

To select an existing Report Query click on the small down arrow in the top section of the Report Query box and select the desired query. When a query is selected the next step is to make selections for the available reporting options from a dynamic (i.e., still evolving) array of Report Query settings. Currently there are two such options for consideration: one 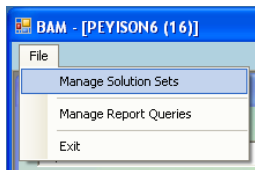for the Solution Set to be used and another for the speed to be used to define "broadband" in the report. As the BAM continues to evolve additional report query option settings will quite likely be made available. The illustration here shows a screen where the user defined broadband as 0.768 by virtue of selecting 0.768 as the report option – and is in the process of designating the AL_MG_Test Solution Set to be used for the report.
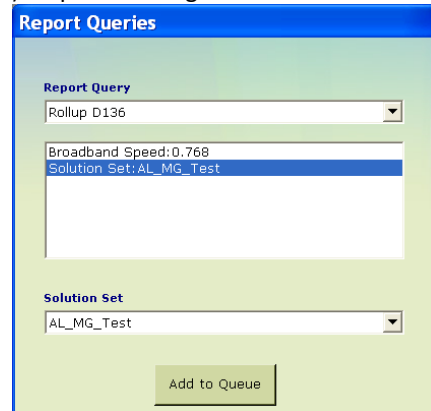
As noted above, consistent with the creation of a solution set certain report query selections allow the user to enter specific values (as illustrated here). When specific values are entered, the user clicks SAVE.

When these two items have been aligned – a specific Report Query with a specific Solution Set and a specific broadband speed – the query can be added to the queue for generation (**Add to Queue**).
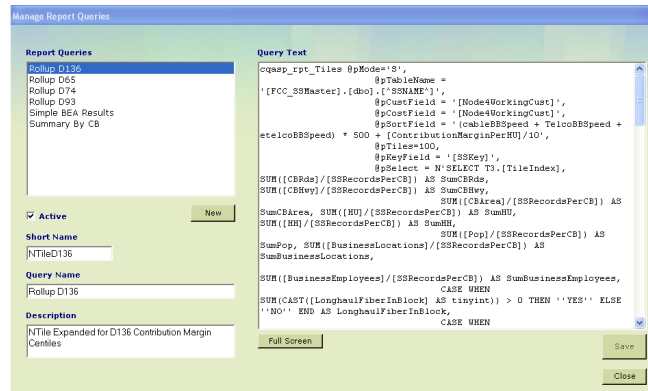
If a new Report Query is required – if no existing query will meet user needs – click on **File** in the upper left hand corner and select **Manage Report Queries**. When this is selected the following screen will open. Within this single screen one can name a new query (both short and slightly longer/more explanatory names), provide a brief description of the query and actually write the query in SQL. A Full Screen mode is provided to assist with developing the Report Query itself.

When the new Report Query is completed click **Save** to retain it in the BAM.

Also, an existing Report Query can be made active or inactive within this screen. Only active Report Queries appear in the main screen dialogue for user selection and processing.

Working with the Queue

A Solution Set is processed and a Report is generated through the BAM Queue. Accordingly, once created/defined users must click on the **Add to Queue** button in both the Solution Set section of the screen and the Report Query section of the screen. When this is done the particular Solution Set and the particular Query will appear in the Queue component of the BAM main screen (illustrated here).
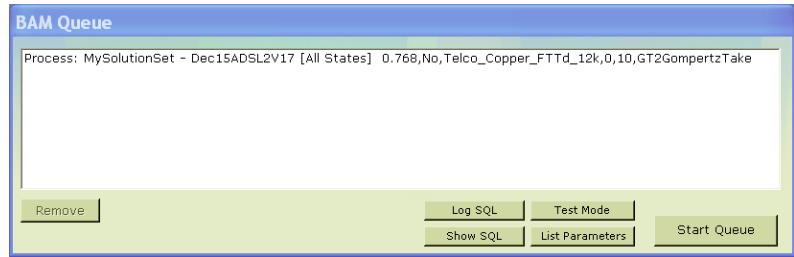
Items can be removed by highlighting the item and clicking on **Remove**.

Note: the Log SQL, Show SQL, Test Mode and List Parameter options are for development purposes only and should not be used. These options will eventually be removed from the standard BAM options.

Processing and Accessing Results

When all jobs have been placed in the Queue, click on **Start Queue** to begin processing Solution Sets and generating Reports. Processing times are roughly 1-8 hours for the full 50 States. A typical Report can be generated in 5-10 minutes.

Report Queries and processed Solution Sets are delivered in the CSV file format and made available in the Results folder within the BAM root directory.

Questions regarding BAM processing should be directed to CostQuest Associates.